

Portland West Quadrangle, Maine

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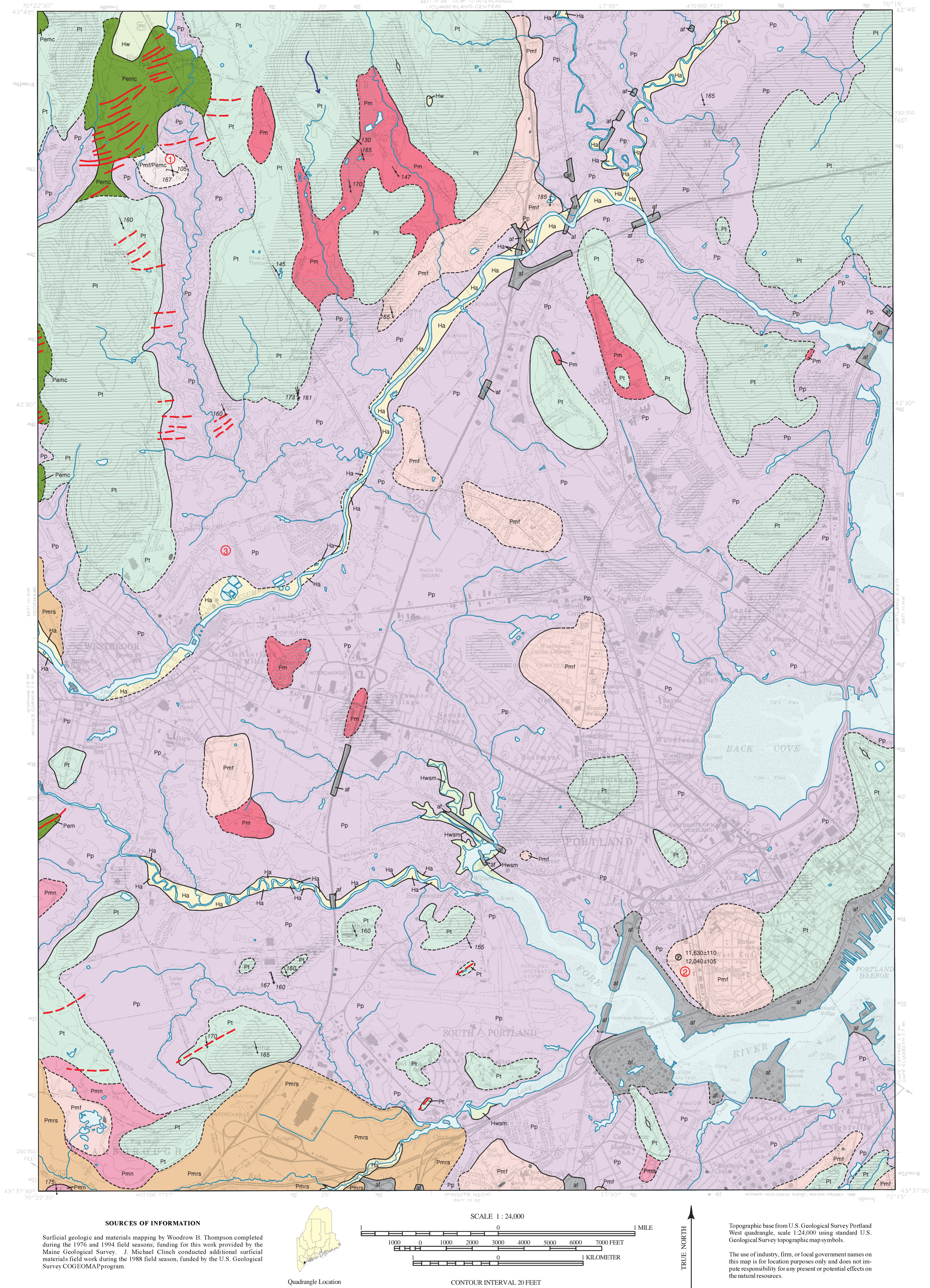
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For additional information,
see Open-File Report 97-66.

Surficial Geology



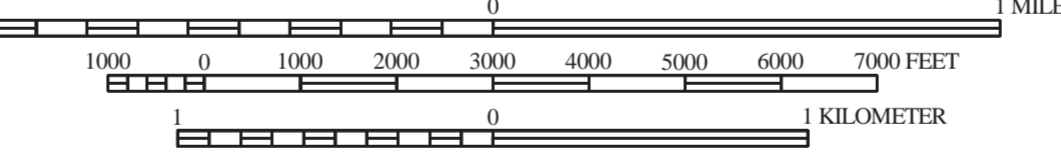
SOURCES OF INFORMATION

Surficial geologic and materials mapping by Woodrow B. Thompson completed during the 1976 and 1994 field seasons, funding for this work provided by the Maine Geological Survey. J. Michael Clinch conducted additional surficial materials field work during the 1988 field season, funded by the U.S. Geological Survey COGEMAP program.



Quadrangle Location

SCALE 1:24,000



CONTOUR INTERVAL 20 FEET



Topographic base from U.S. Geological Survey Portland West quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not implicate responsibility for any present or potential effects on the natural resources.

Note: The first letter of each map unit indicates the general age of the unit:
H = Holocene (postglacial deposit, formed during the last 10,000 years).
Q = Quaternary (deposit of uncertain age, but usually late-glacial and/or postglacial).
P = Pleistocene (deposit formed during glacial to late-glacial time, prior to 10,000 yr B.P. [years before present]).

Ha **Stream alluvium** - Sand, silt, gravel, and organic material. Deposited on flood plains of modern streams.

Hwsm **Salt marsh deposits** - Salt-marsh peat, muck, and fine-grained sediments deposited along tidal inlets.

Hw **Wetland deposits** - Peat, muck, and/or fine-grained sediments deposited in poorly drained (wetland) areas. Variable tree cover may be present.

Pmrs **Marine regressive sand deposits** - Sand, silt, and minor gravel deposited in shallow marine waters during late-glacial regression of the sea. May include a variety of nearshore and fluvial sediments. Commonly occurs as flat sandy areas and is likely to be underlain by marine clay-silt of the Presumpscot Formation.

Pmn **Marine nearshore deposits** - Sand, gravel, and minor silt. Formed by wave and current action in shoreline and shallow nearshore environments, usually during regressive phase of late-glacial marine submergence in Maine's coastal low land.

Pm **Marine deposits, undifferentiated** - Poorly exposed sand and gravel of uncertain origin, thought to have been deposited in the sea during late-glacial time. May include deltaic, submarine fan, shoreline, and/or nearshore deposits.

Pmf **Marine fan deposit** - Sand and gravel deposited on the sea floor at the glacier margin during the late-glacial marine submergence.

Pp **Presumpscot Formation** - Silt, clay, and minor sand deposited on the sea floor during the late-glacial marine submergence.

Pem **End moraine** - Ridge of till and/or sand and gravel deposited at the glacier margin during recession of the last ice sheet.



End moraine complex - Cluster of closely spaced end moraines deposited at the receding margin of the last glacial ice sheet. Composed of till and/or sand and gravel. Locally includes ice-marginal submarine fan deposits.

Till - Loose to very compact, poorly sorted, mostly nonstratified mixture of sand, silt, and gravel-size rock debris deposited directly from glacial ice. Locally contains lenses of water-laid sediment.

Bedrock - Gray areas are individual outcrops. Ruled pattern indicates areas where outcrops are common and/or surficial sediments are generally less than 10 ft thick.

Artificial fill - Variable mixtures of surficial sediments, rock fragments, and artificial materials, transported and dumped to build roads, waterfronts, etc.

Contact - Boundary between map units. Dashed where very approximate.

End moraine - Line shows axis of end-moraine ridge. Dashed where inferred or approximately located, especially in areas where moraines are overlain by younger sediments.

Glacially streamlined hill - Symbol shows trend of long axis of hill, which parallels former ice-flow direction.

Glacial striation locality - Arrows show ice-flow directions (with azimuths in degrees) inferred from striations (scratches on bedrock caused by glacial abrasion). Dot marks point of observation. Flagged trend is older.

Meltwater channel - Channel eroded by glacial meltwater. Arrow shows inferred direction of former stream flow.

Fossil locality - Fossil locality in marine sediments, with age in radiocarbon years. See text for details.

Photo locality - Location of photographed site shown and described in map legend.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for any one wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

- Thompson, W. B., 1997, Surficial geology of the Portland West 7.5-minute quadrangle, Cumberland County, Maine: Maine Geological Survey, Open-File Report 97-66, 10 p.
- Thompson, W. B., 1999, Surficial materials of the Portland West quadrangle, Maine: Maine Geological Survey, Open-File Map 99-38.
- Neil, C. D., 1999, Significant sand and gravel aquifers of the Portland West quadrangle, Maine: Maine Geological Survey, Open-File Map 99-11.
- Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print).
- Thompson, W. B., and Borris, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
- Thompson, W. B., Crossen, K. J., Borris, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, in Anderson, W. A., and Borris, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.